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The Short Time UV Laser Exposure do not cause DNA Damage in Boar Spermatozoa Assessed by Comet Assay

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Controlling the sex of offspring by the separation of X and Y chromosome-bearing spermatozoa using flow cytometry has been reported as a clinical technique aiding prevention of X-linked diseases. This technique has already resulted in several hundred normal births in animals and at least one human birth, but there is still concern over its genetic safety due to the involvement of mutagenic factor: UV light(330 to 360nm) emitted by flow cytometry.

The porcine has a X and Y chromosome-bearing same as human. Not only control of genetic disease in human but also control of sex of pig in farm is significant. Pigs are generally used for food in that they grow up relatively fast and one female could breed many babies at a time. In addition to that, sow meat is preferred to eat rather than hog meat.

For the mass production of sow, the accuracy of sperm sorting has to be enhanced and the cell may be exposed to UV light for a long time. Therefore, the integrity of sperm DNA must be investigated before applying this method to control genetic disorders. When it is used under non-verified circumstances, damages of the sperm DNA cause the severely abnormal development of the embryo, fetus and child. Moreover, ICSI, one of the improved techniques for artificial insemination, will increases the risk of transmitting damaged DNA by bypassing sperm selection mechanisms.

Our results demonstrate that comet assay can be used for inspecting boar sperm DNA inactivation by UV light emitted in flow cytometry. When diluted sperm suspensions (200-fold) were exposed to

H_2O_2 for positive control, evident increase in DNA fragmentation was observed. There also be a lot of damage when sperm sample is treated by UV light for 60s, but no damage has observed for 5s, 10s, 15s including control. This study demonstrated, with the use of comet assay, that DNA fragmentation of boar spermatozoa is not sensitive by UV irradiation and short time irradiation of UV light on flow cytometry has no effect on sperm DNA damages.

This work was supported by the Research Project on the Production of Bio-organs(No. 200508020702) Ministry of Agriculture and Forestry, Republic of Korea.